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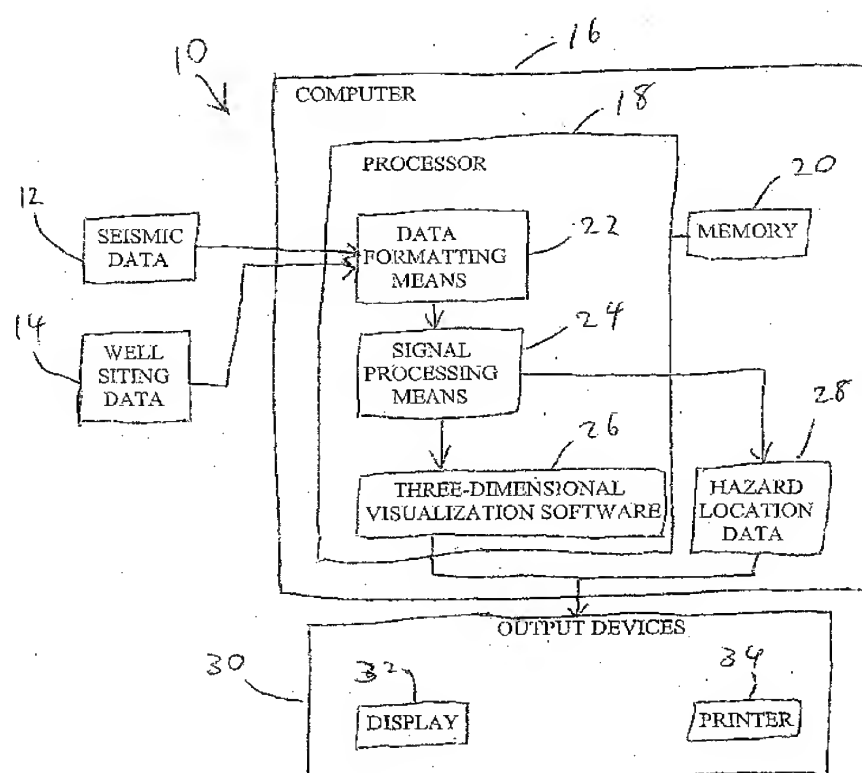
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(54) Title: PREDICTION OF SHALLOW DRILLING HAZARDS USING SEISMIC REFRACTION DATA



(57) Abstract: Shallow drilling hazards, such as karsts, caves, voids and unconsolidated discontinuities, that can pose significant risks to exploration and development well drilling operations are detected employing seismic refraction data on which a series of attribute analyses are performed, the resulting data being further processed to provide a three-dimensional visualization. Refracted wave raypaths are highly distorted by encountering a karst feature with the occurrence of backscattering absorption. The resultant energy recorded at the surface receivers is significantly reduced as compared to refracted waves recorded by other receivers where no karsting is present. Multiple refractors are subjected to a relatively simple and rapid processing using commercially available software to track these differences and to map them in the near surface to improve the siting of wells and to alert drilling engineers and crews to the possibility of encountering the hazard.